Community GIS or Community vs GIS?

Bal Krishna
Associate Editor
GIS@development
G-4, Sector 39, Noida – 201 301
Uttar Pradesh, India
Tel: +91-120-4502180-87 (office)
+91-11-2626989 (residence)
Fax: +91-120-4500060
Email: Bal.Krishna@gisdev.net

Abstract
In view of the advent of technology such as GIS, Remote Sensing, GPS and Internet, a situation is being created where a certain section of the society is able to avail the benefits of these technologies where as a larger section of the society especially in rural areas, mostly in developing world is far from having any access of these technologies. As a consequence, these technologies may end up creating digital divide rather than being a tool to make the world digital. The proposed paper will deal with some fundamental issues how to take GIS to grassroots and moreover in the process if local community participation can be ensured. The paper will deliberate upon applicability and usability of GIS and related technology in rural context in terms of its affordability, acceptability, replicability, scalability and sustainability. Issues related to engaging community in the entire process of data collection, data interpretation and evolving some developmental plan will also be discussed by giving examples of some ongoing projects.

Introduction
Technology especially like Remote Sensing (RS) and Geographic Information Systems (GIS) has been the technologies who have basically top-down approach. As use of technology needs considerable level of expertise, it is generally confined to the scientists, experts, and laboratories. Being projected as decision support systems, now, these technologies are making in roads and gaining popularity among decision makers and policy professionals. However, to achieve a certain level social and cultural resonance is critical to any effort that seeks not only to develop a community but also to engage the population with technology. Most communities have not traditionally enjoyed the benefits of modern technologies. Hence one has to remember that the advent of technology, as decision-support for development can perceive constraints of basic acceptance from any community. Therefore, while searching for effective strategies to diffuse computer-based technology, it is incumbent upon designers and planners to ensure that the infrastructure is well suited to the 'interests' of end-users and those of the society at large. When people can readily see the benefits of these technologies in improving their life, and their community, they will embrace them faster, thus achieving some measure of resonance with their social and cultural milieu. However, what is often left aside if the issue of whether a digitally literate community is better than a traditional one. In other words, is there a need to sensitise communities if local indigenous practises can solve matters easily?

'Tools' not 'schemes'?
At the same time, providing ready-made schemes prepared outside of the community may not lead to any solution at all. Many such initiatives have failed despite regular efforts by the government as well as many concerned individuals and NGOs. The community need 'tools' and not 'schemes' to manage and plan their own environment as they see fit. A tool that is specific to their context, a tool that takes data and transposes it onto interactive maps making complex problems visually revealing and at the same time interactive enough for them to assert their own solutions.

Interactive community maps could be a modest beginning. In India, village maps do not exist. GIS, if it can act as a decision support system for a policy maker then why it can't be used by

village panchayats. The 73rd amendment of the Constitution of India that empowers village panchayats to take decisions for village development offers an opportunity for such initiatives.

At this point it is imperative to briefly address the basic concepts of a 'community' and 'community GIS'.

Understanding a community and Community GIS

There are numerous definitions of the terms 'community' and 'neighbourhood'. In the given ambit of their differences, the underlying similarity in all definitions is the necessity of the presence of a common binding factor. Hence a community is a group of people having a set of common factors that bind them in some particular dimension. This binding factor can range from ethnicity, nationality and religion to business interests, political agendas and personal habits. Hence the first crucial issue is to understand which type of community we are actually addressing or aiming to satisfy when we talk of 'Community GIS'.

Community GIS

GIS is a strong tool, which stores spatial as well as non-spatial data digitally and establishes a link between the two. Resultantly it produces not just maps but an information system, which can retrieve, analyse and represent the stored data in desired ways. It can be utilised in numerous applications like planning, rural development etc. A digital database also has the advantage of easy cost-effective updating, transparency, rationality and strength of complex analysis. Community GIS should be such an information system, which is totally for a community. Such a system ideally should be 'by, for and of' a community. In other words, such an exercise shall not only involve community through participatory methods in the database generation, assimilation and analysis but also essentially address the needs, problems and priorities of that particular community. More importantly, it is crucial to understand whether territorial communities do require a digital intervention rather than assuming that they necessarily do.

The context of community GIS

About three-fourth of the developing world's population still live in rural areas, what emerges is a totally different dimension of priorities, aspirations, background and culture. The underserved communities of the developing world (which form the worlds majority) place high priority on, concerns of access to shelter, basic nutrition, access to basic health facilities and basic services of drinking water, sanitation and work. Such communities, that have over decades developed indigenously on their own, patterns of surviving with the odds and finding local solutions to their needs, have a different set of wants. Such wants may be addressed by in-depth analysis of GIS, but once again, one needs to alienate the role of GIS at a different strategic level and understand that there might be no actual need of 'Community GIS'.

The need for Information Systems

In the wake of renewed global emphasis on local level planning and participatory decision-making, the aspects of proper knowledge, detailed information and impartial analysis are necessary and critical. Also considering the inherent drawbacks in the developing world, as discussed above, the need for efforts that promote transparency is unquestioned. Technology and GIS come with the promise of enhancing transparency, rationality and lucidity. A number of critical questions come up at this juncture,

- Are communities in the developing nations in a position to accept GIS?
- To what degree do they benefit? What differences does the introduction of GIS actually make to their lives?
- How many local governing bodies in a position to afford GIS?

- To what degree can the community actually be 'there' in a community GIS, given it's priorities and living conditions?
- What is the motivation behind accepting such changes?

The question of acceptability

Communities of the developing world are loaded with various critical agendas; the motive being upliftment of living standards. With regard to various strategies of human and physical development, GIS does have a positive role to play. However, making a community to take up the technology might see basic practical obstacles, as follows (Carver, 2001),

- Majority of developing nations' communities are illiterate or primary-level educated living in adversary conditions. In the face of scarcity of resources and basic needs, using GIS and IT for database generation can seem luxuries beyond sensible search for opportunities;
- Political resistance to 'real' local empowerment is also probable at the local or from higher level power holders;
- Serious time constraint might crop up in the participation process which has to include extensive training of illiterates which shall also infringe upon their daily occupation.

What benefit does GIS bring and what is their role?

A clear understanding of the 'insiders and outsiders' of Indigenous Spatial Knowledge (ISK) and Indigenous Technical Knowledge (ITK) as discussed by McCall is essential to address this query. It may be attractive to assume, by many, that IT and GIS based spatial knowledge ought to be equitably distributed for many of its 'far reaching positive effects', but this can be argued (McCall, 2002). GIS can certainly shape a better development mission but a community doesn't necessarily have to take up GIS technologies as untapped indigenous knowledge is already found in most communities as (McCall, 1988),

- Vernacular technical knowledge;
- Social and detailed spatial knowledge belonging to local groups;
- Specialised knowledge of skilled resource persons;
- Traditional power structures that control the overall development.

Documentation of this knowledge is essential through their participation but its analysis with IT and GIS is an aspect, which may not be the focus at the community level. The actual impact of GIS analysis for development works gains critical mass at a slightly higher level, which can be a cluster of communities or a group of villages. At the next level one can actually integrate, compare, judge and develop options for thrust areas and then properly attend to issues. However, one has to understand that to build the regional level database one needs to start at grassroots. Hence, Community GIS may not give any tangible direct benefit to the communities at the family level. Yet, its component of database generation at the community level, with local participation can create more aware and interested communities. Hence one should clearly understand that at village / community level, GIS shouldn't attempt or promise to provide tangible benefits to the lives of the communities.

What is the community's motivation?

A critical paradigm of reasoning, before assuming that community development essentially needs GIS, is to deliberate upon the incentive that the communities have to accept technology. Practical sustainability and success is only possible once the 'GIS community' tries to perceive the types of motivation they can provide for a community to recognise 'Community GIS'. This essential question is fundamental in many success and failure stories of endeavors to propagate Community GIS. A holistic approach of community engagement with technology, one that seeks to identify the community's interests and issues first, and then determines how and whether at all,

technology can support those interests is a pragmatic approach. One has to understand that the introduction of GIS needs to be conceptualised with a clear aim – is it the benefit that we are seeking, or are we aiming at its day-to-day usage? Benefit of a technology can also seep in without necessarily spending efforts to make it a household product. Hence the comprehension of Community GIS in its 'usability' and its 'effectuality' are different.

Raising implications

At the intersection between community building and community technology lies tremendous synergy. Each of these domains seeks to empower individuals and families, and improve their overall environment. Surprisingly, approaches that combine these areas are less researched upon. In response to the digital divide, the challenge in most low-income communities has been to identify strategies for engaging residents with technology, providing economical access to it, and encouraging its meaningful use. These efforts have largely and justifiably focused on establishing infrastructure and providing training. As computers and the Internet continue to penetrate these communities, it begs the question of what can actually be done to truly leverage a given technological base, what can it address in under-developed communities, how does it sustain itself as a priority, once the propulsion is taken off?

It is suggested that 'Community GIS' might be more comprehendible if it sticks to the basis of its definition i.e., limiting itself to an exercise that aims at benefiting the community and involving them in the process. It should not divert into attempts of installing the use of GIS by them. The involvement part of the community needs to be more researched upon, and depending on the type of community being addressed, one has to understand the level of technology to be percolated to the grassroots. The usage and analysis of GIS for judgemental purposes like environmental parameters, developmental and infrastructural issues can be conceptualised at different strategic levels. At the same time a computer literate and advanced community with different set of needs, can become highly involved in GIS knowledge acceptance, but one has to understand the profile of the community before introducing the techniques. Hence with respect to majority of communities of the developing world, one has to understand that 'Community GIS' has to lay stress on local indigenous practises and knowledge for its success. Experimentation to gauge the level of acceptance and effectiveness has to be carried out. Thorough deliberation on the following two facets, which touch upon monitoring, evaluation and sustainability, can streamline the focus before carrying GIS gadgets to underfed communities:

- To whom in grassroots organisations is GIS based information and analysis made available?
- How does the acceptance and use of GIS affect the overall goals and internal dynamics of grassroots movements?

It also needs to be emphasized that, based on existing research in organisational sociology and social movements, several possible consequences of the implementation of GIS are possible. One needs to perceive GIS in terms of: (1) A shift in mission, as use of participatory mapping encourages grassroots groups to become more instrumentalist in their thinking; (2) Preventing the split developing within the movement between more technocratic groups, who have become expert in and committed to market the new technology and others who resist its application and relevance (which in extreme cases can disrupt the effectiveness of the entire organisation, or its legitimacy for its constituency), and; (3) ensuring that there is no marginalisation of local knowledge and community perspectives that cannot easily be integrated into the technology.

GIS to grassroots

Taking GIS to grassroots apparently seems to be a good idea. However a conscious effort has to be made to reorient the community as well as the technology to demonstrate the linkages of GIS and its potential in solving the community problems. Simultaneously, a unique and affordable

user-technology interface will have to be developed to ensure sustainability of the concept. Moreover, the success of such concepts should not be measured in terms of development of participatory interactive maps or creation of an low cost affordable GIS but should be measured in terms of evolved consciousness of villagers towards proper utilisation of the physical space and natural resources.

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